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FISHERY STATISTICS OF THE WESTERN PACIFIC  
VOLUME X

Territory of American Samoa (1993)  
Commonwealth of the Northern Mariana Islands (1993)  
Territory of Guam (1993)  
State of Hawaii (1993)

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## PREFACE

In recent years, the demand for data and information concerning marine fisheries has greatly increased. To help meet these increased needs in the central and western Pacific areas, the National Marine Fisheries Service's Southwest Fisheries Center initiated the Western Pacific Fishery Information Network (WPACFIN), which assists Pacific island fisheries agencies in upgrading their data collecting, processing, and reporting capabilities. Several agencies are participating in this program: the National Marine Fisheries Service's Southwest Fisheries Science Center and its Honolulu Laboratory, and the Southwest Region and its Pacific Area Office, American Samoa's Department of Marine and Wildlife Resources, the Commonwealth of the Northern Mariana Islands' Division of Fish and Wildlife, Guam's Division of Aquatic and Wildlife Resources, Hawaii's Division of Aquatic Resources, and the Western Pacific Regional Fishery Management Council.

In 1982, these agencies formed a Fisheries Data Coordinating Committee (FDCC) and a FDCC Technical Subcommittee to help guide, coordinate, and monitor all of the many activities being undertaken by each agency to improve their systems. Significant progress has been made by all participating agencies, particularly in the areas of upgrading data collecting and processing systems.

As a major step in improving and coordinating the data reporting and distributing systems of the agencies, in May 1985, the FDCC agreed to begin producing a combined document reporting each island's major fisheries statistics. Production of the document would be the responsibility of the FDCC Technical Subcommittee and would be coordinated by the WPACFIN program manager. Each agency would supply the data required to produce the tables and graphs for its respective chapter of the report, and central WPACFIN staff would produce and distribute the document as part of the Administrative Report Series of the Southwest Fisheries Science Center.

This document is the tenth volume in the series "Fishery Statistics of the Western Pacific" and contains summaries of commercial and creel survey fishery landings data for 1993 for American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, and Hawaii. The first nine volumes of this series contained similar reports for these areas for 1979 through 1992. Volumes nine and ten are different from the previous volumes in that the Guam chapter contains only commercial landings data because no creel survey data were available from the Division of Aquatic and Wildlife Resources.

## CONTENTS

	PAGE
I. Background	I.1
Progress	I.1
Precautions	I.2
Contents	I.2
Definitions	I.2
Graphics	I.3
II. American Samoa 1993 Fishery Statistics	
Introduction	II.1
Data Collecting System	II.1
Data Processing System	II.2
Data Reporting System	II.4
Interpretation of Statistics	II.9
Tables and Figures	II.10
III. Commonwealth of the Northern Mariana Islands 1993 Fishery Statistics	
Introduction	III.1
Data Collecting System	III.1
Data Processing System	III.2
Data Reporting System	III.3
Tables and Figures	III.5
IV. Guam 1993 Fishery Statistics	
Introduction	IV.1
Commercial Landings Data Collecting System	IV.2
Commercial Landings Data Processing System	IV.2
Commercial Landings Data Reporting System	IV.3
Interpretation of Statistics	IV.5
Tables and Figures	IV.6
IV. State of Hawaii 1993 Fishery Statistics	
Introduction	V.1
Data Collecting System	V.1
Data Processing System	V.2
Data Reporting System	V.3
Tables and Figures	V.6

## LIST OF AMERICAN SAMOA SUMMARY TABLES

Table	Title	Page
II.1.1	American Samoa 1993 Estimated Commercial Landings	II.10
II.1.2	American Samoa January 1993 Estimated Commercial Landings	II.12
II.1.3	American Samoa February 1993 Estimated Commercial Landings	II.12
II.1.4	American Samoa March 1993 Estimated Commercial Landings	II.13
II.1.5	American Samoa April 1993 Estimated Commercial Landings	II.13
II.1.6	American Samoa May 1993 Estimated Commercial Landings	II.14
II.1.7	American Samoa June 1993 Estimated Commercial Landings	II.15
II.1.8	American Samoa July 1993 Estimated Commercial Landings	II.16
II.1.9	American Samoa August 1993 Estimated Commercial Landings	II.17
II.1.10	American Samoa September 1993 Estimated Commercial Landings	II.18
II.1.11	American Samoa October 1993 Estimated Commercial Landings	II.19
II.1.12	American Samoa November 1993 Estimated Commercial Landings	II.20
II.1.13	American Samoa December 1993 Estimated Commercial Landings	II.21
II.2.1	American Samoa 1993 Manu'a Estimated Commercial Landings	II.22
II.2.2	American Samoa January 1993 Manu'a Estimated Commercial Landings	II.23
II.2.3	American Samoa February 1993 Manu'a Estimated Commercial Landings	II.23
II.2.4	American Samoa March 1993 Manu'a Estimated Commercial Landings	II.23
II.2.5	American Samoa April 1993 Manu'a Estimated Commercial Landings	II.24
II.2.6	American Samoa May 1993 Manu'a Estimated Commercial Landings	II.24
II.2.7	American Samoa June 1993 Manu'a Estimated Commercial Landings	II.25
II.2.8	American Samoa July 1993 Manu'a Estimated Commercial Landings	II.25
II.2.9	American Samoa August 1993 Manu'a Estimated Commercial Landings	II.26
II.2.10	American Samoa September 1993 Manu'a Estimated Commercial Landings	II.26

## LIST OF AMERICAN SAMOA SUMMARY TABLES (cont.)

Table	Title	Page
II.2.11	American Samoa October 1993 Manu'a Estimated Commercial Landings	II.27
II.2.12	American Samoa November 1993 Manu'a Estimated Commercial Landings	II.27
II.2.13	American Samoa December 1993 Manu'a Estimated Commercial Landings	II.28
II.3.1	Tutuila 1993 Annual Offshore Creel Survey Summary Expansion Reports	II.40
II.3.2	Tutuila 1993 Annual Offshore Creel Survey Species Composition	II.41
II.4.1	Tutuila January 1993 Offshore Creel Survey Expansion Summary	II.42
II.4.2	Tutuila February 1993 Offshore Creel Survey Expansion Summary	II.42
II.4.3	Tutuila March 1993 Offshore Creel Survey Expansion Summary	II.42
II.4.4	Tutuila April 1993 Offshore Creel Survey Expansion Summary	II.43
II.4.5	Tutuila May 1993 Offshore Creel Survey Expansion Summary	II.43
II.4.6	Tutuila June 1993 Offshore Creel Survey Expansion Summary	II.43
II.4.7	Tutuila July 1993 Offshore Creel Survey Expansion Summary	II.44
II.4.8	Tutuila August 1993 Offshore Creel Survey Expansion Summary	II.44
II.4.9	Tutuila September 1993 Offshore Creel Survey Expansion Summary	II.44
II.4.10	Tutuila October 1993 Offshore Creel Survey Expansion Summary	II.45
II.4.11	Tutuila November 1993 Offshore Creel Survey Expansion Summary	II.45
II.4.12	Tutuila December 1993 Offshore Creel Survey Expansion Summary	II.45
II.5.1	Tutuila January 1993 Offshore Creel Survey Species Composition	II.46
II.5.2	Tutuila February 1993 Offshore Creel Survey Species Composition	II.46
II.5.3	Tutuila March 1993 Offshore Creel Survey Species Composition	II.47
II.5.4	Tutuila April 1993 Offshore Creel Survey Species Composition	II.47
II.5.5	Tutuila May 1993 Offshore Creel Survey Species Composition	II.48
II.5.6	Tutuila June 1993 Offshore Creel Survey Species Composition	II.48

## LIST OF AMERICAN SAMOA SUMMARY TABLES (cont.)

Table	Title	Page
II.5.7	Tutuila July 1993 Offshore Creel Survey Species Composition	II.49
II.5.8	Tutuila August 1993 Offshore Creel Survey Species Composition	II.50
II.5.9	Tutuila September 1993 Offshore Creel Survey Species Composition	II.51
II.5.10	Tutuila October 1993 Offshore Creel Survey Species Composition	II.51
II.5.11	Tutuila November 1993 Offshore Creel Survey Species Composition	II.52
II.5.12	Tutuila December 1993 Offshore Creel Survey Species Composition	II.52

## LIST OF CNMI SUMMARY TABLES

Table	Title	Page
III.1.1	CNMI 1993 Commercial Landings	III.5
III.1.2	CNMI January 1993 Commercial Landings	III.6
III.1.3	CNMI February 1993 Commercial Landings	III.7
III.1.4	CNMI March 1993 Commercial Landings	III.8
III.1.5	CNMI April 1993 Commercial Landings	III.9
III.1.6	CNMI May 1993 Commercial Landings	III.10
III.1.7	CNMI June 1993 Commercial Landings	III.11
III.1.8	CNMI July 1993 Commercial Landings	III.12
III.1.9	CNMI August 1993 Commercial Landings	III.13
III.1.10	CNMI September 1993 Commercial Landings	III.14
III.1.11	CNMI October 1993 Commercial Landings	III.15
III.1.12	CNMI November 1993 Commercial Landings	III.16
III.1.13	CNMI December 1993 Commercial Landings	III.17

## LIST OF GUAM SUMMARY TABLES

Table	Title	Page
IV.1.1	Guam 1993 Commercial Landings	IV.6
IV.1.2	Guam January 1993 Commercial Landings	IV.7
IV.1.3	Guam February 1993 Commercial Landings	IV.8
IV.1.4	Guam March 1993 Commercial Landings	IV.9
IV.1.5	Guam April 1993 Commercial Landings	IV.10
IV.1.6	Guam May 1993 Commercial Landings	IV.11
IV.1.7	Guam June 1993 Commercial Landings	IV.12
IV.1.8	Guam July 1993 Commercial Landings	IV.13
IV.1.9	Guam August 1993 Commercial Landings	IV.14

## LIST OF GUAM SUMMARY TABLES (cont.)

Table	Title	Page
IV.1.10	Guam September 1993 Commercial Landings	IV.15
IV.1.11	Guam October 1993 Commercial Landings	IV.16
IV.1.12	Guam November 1993 Commercial Landings	IV.17
IV.1.13	Guam December 1993 Commercial Landings	IV.18

## LIST OF HAWAII SUMMARY TABLES

Table	Title	Page
V.1.1	Hawaii 1993 Commercial Landings	V.6
V.1.2	Hawaii 1993 Commercial Landings Not Sold	V.8
V.1.3	Hawaii January 1993 Commercial Landings	V.10
V.1.4	Hawaii February 1993 Commercial Landings	V.12
V.1.5	Hawaii March 1993 Commercial Landings	V.14
V.1.6	Hawaii April 1993 Commercial Landings	V.16
V.1.7	Hawaii May 1993 Commercial Landings	V.18
V.1.8	Hawaii June 1993 Commercial Landings	V.20
V.1.9	Hawaii July 1993 Commercial Landings	V.22
V.1.10	Hawaii August 1993 Commercial Landings	V.24
V.1.11	Hawaii September 1993 Commercial Landings	V.26
V.1.12	Hawaii October 1993 Commercial Landings	V.28
V.1.13	Hawaii November 1993 Commercial Landings	V.30
V.1.14	Hawaii December 1993 Commercial Landings	V.32

## LIST OF AMERICAN SAMOA FIGURES

Table	Title	Page
II.1.1	American Samoa 1993 Fisheries Categories: Pelagic, Bottom, Reef, and Other	II.29
II.1.2	American Samoa 1993 Monthly Landings of Tunas, PMUS, and BMUS	II.29
II.1.3	American Samoa 1993 Monthly Landings of Wahoo, Mahimahi, and Billfish	II.30
II.1.4	American Samoa 1993 Monthly Landings of Skipjack, Yellowfin, and Other Tunas	II.30
II.2.1	American Samoa 1982-1993 Average Monthly Landings of Tunas, PMUS, and BMUS	II.31
II.2.2	American Samoa 1982-1993 Average Monthly Landings of Wahoo and Mahimahi	II.31
II.2.3	American Samoa 1982-1993 Average Monthly Landings of Blue Marlin and Sailfish	II.32
II.2.4	American Samoa 1982-1993 Average Monthly Landings of Skipjack, Yellowfin, and Other Tunas	II.32
II.2.5	American Samoa 1982-1993 Average Monthly Landings of BMUS, Onaga, and Ehu	II.33
II.3.1	American Samoa 1982-1993 Annual Trends of Fisheries Categories: Pelagic, Bottom, Reef, and Other	II.33
II.3.2	American Samoa 1982-1993 Annual Trends of Total Commercial Landings	II.34
II.3.3	American Samoa 1982-1993 Annual Trends of Tunas, PMUS, and BMUS Landings	II.34
II.3.4	American Samoa 1982-1993 Annual Trends of Wahoo, Mahimahi, and Billfish	II.35
II.3.5	American Samoa 1982-1993 Annual Trends of Skipjack, Yellowfin, and Other Tunas	II.35
II.4.1	American Samoa 1982-1993 Landings of Wahoo	II.36
II.4.2	American Samoa 1982-1993 Landings of Mahimahi	II.36
II.4.3	American Samoa 1982-1993 Landings of Blue Marlin	II.37
II.4.4	American Samoa 1982-1993 Landings of Sailfish	II.37
II.4.5	American Samoa 1982-1993 Landings of Skipjack Tuna	II.38
II.4.6	American Samoa 1982-1993 Landings of Yellowfin Tuna	II.38
II.4.7	American Samoa 1982-1993 Landings of Onaga	II.39
II.4.8	American Samoa 1982-1993 Landings of Ehu	II.39



## LIST OF AMERICAN SAMOA FIGURES (cont.)

Table	Title	Page
II.5.1	Tutuila 1993 Expanded Monthly Catch by Method	II.53
II.5.2	Tutuila 1993 Expanded Monthly Effort by Method	II.53
II.5.3	Tutuila 1986-1993 Offshore Expanded Total Catch and Effort	II.54

## LIST OF CNMI FIGURES

Table	Title	Page
III.1.1	CNMI 1993 Fisheries Categories: Pelagic, Bottom, Reef, and Other	III.18
III.1.2	CNMI 1993 Monthly Landings of Tunas, PMUS, and BMUS	III.18
III.1.3	CNMI 1993 Monthly Landings of Wahoo, Mahimahi, and Billfish	III.19
III.1.4	CNMI 1993 Monthly Landings of Skipjack, Yellowfin, and Other Tunas	III.19
III.2.1	CNMI 1979-1993 Average Monthly Landings of Tunas, PMUS, and BMUS	III.20
III.2.2	CNMI 1979-1993 Average Monthly Landings of Wahoo and Mahimahi	III.20
III.2.3	CNMI 1979-1993 Average Monthly Landings of Blue Marlin And Sailfish	III.21
III.2.4	CNMI 1979-1993 Average Monthly Landings of Skipjack, Yellowfin, and Other Tunas	III.21
III.2.5	CNMI 1979-1993 Average Monthly Landings of BMUS, Emperor, and Grouper	III.22
III.3.1	CNMI 1979-1993 Annual Trend of Fisheries Categories: Pelagic, Bottom, Reef, Other	III.22
III.3.2	CNMI 1979-1993 Annual Trends of Total Commercial Landings	III.23
III.3.3	CNMI 1979-1993 Annual Trends of Tunas, PMUS, and BMUS Landings	III.23
III.3.4	CNMI 1979-1993 Annual Trends of Wahoo, Mahimahi, and Billfish	III.24
III.3.5	CNMI 1979-1993 Annual Trends of Skipjack, Yellowfin, and Other Tunas	III.24
III.4.1	CNMI 1979-1993 Landings of Wahoo	III.25
III.4.2	CNMI 1979-1993 Landings of Mahimahi	III.25

## LIST OF CNMI FIGURES (cont.)

Table	Title	Page
III.4.3	CNMI 1979-1993 Landings of Marlin	III.26
III.4.4	CNMI 1979-1993 Landings of Sailfish	III.26
III.4.5	CNMI 1979-1993 Landings of Skipjack Tuna	III.27
III.4.6	CNMI 1979-1993 Landings of Yellowfin Tuna	III.27
III.4.7	CNMI 1979-1993 Landings of Emperor	III.28
III.4.8	CNMI 1979-1993 Landings of Grouper	III.28

## LIST OF GUAM FIGURES

Table	Title	Page
IV.1.1	Guam 1993 Fisheries Categories: Pelagic, Bottom, Reef, and Other	IV.19
IV.1.2	Guam 1993 Monthly Landings of Tunas, PMUS, and BMUS	IV.19
IV.1.3	Guam 1993 Monthly Landings of Wahoo, Mahimahi, and Billfish	IV.20
IV.1.4	Guam 1993 Monthly Landings of Skipjack, Yellowfin, and Other Tunas	IV.20
IV.2.1	Guam 1979-1993 Average Monthly Landings of Tunas, PMUS, and BMUS	IV.21
IV.2.2	Guam 1979-1993 Average Monthly Landings of Wahoo and Mahimahi	IV.21
IV.2.3	Guam 1979-1993 Average Monthly Landings of Marlin, Spearfish, and Sailfish	IV.22
IV.2.4	Guam 1979-1993 Average Monthly Landings of Skipjack, Yellowfin, and Other Tunas	IV.22
IV.2.5	Guam 1979-1993 Average Monthly Landings of BMUS, Grouper, and Emperor	IV.23
IV.3.1	Guam 1979-1993 Annual Trend of Fisheries Categories: Pelagic, Bottom, Reef, and Other	IV.23
IV.3.2	Guam 1979-1993 Annual Trends of Total Commercial Landings	IV.24
IV.3.3	Guam 1979-1993 Annual Trends of Tunas, PMUS, and BMUS Landings	IV.24
IV.3.4	Guam 1979-1993 Annual Trends of Wahoo, Mahimahi, and Billfish	IV.25
IV.3.5	Guam 1979-1993 Annual Trends of Skipjack, Yellowfin, and Other Tunas	IV.25

## LIST OF GUAM FIGURES (cont.)

Table	Title	Page
IV.4.1	Guam 1979-1993 Monthly Landings of Wahoo	IV.26
IV.4.2	Guam 1979-1993 Monthly Landings of Mahimahi	IV.26
IV.4.3	Guam 1979-1993 Monthly Landings of Marlin	IV.27
IV.4.4	Guam 1979-1993 Monthly Landings of Sailfish	IV.27
IV.4.5	Guam 1979-1993 Monthly Landings of Spearfish	IV.28
IV.4.6	Guam 1979-1993 Monthly Landings of Skipjack Tuna	IV.28
IV.4.7	Guam 1979-1993 Monthly Landings of Yellowfin Tuna	IV.29
IV.4.8	Guam 1979-1993 Monthly Landings of Emperor	IV.29
IV.4.9	Guam 1979-1993 Monthly Landings of Grouper	IV.30

## LIST OF HAWAII FIGURES

Table	Title	Page
V.1.1	Hawaii 1993 Fisheries Categories: Pelagic, Bottom, Reef, and Other	V.34
V.1.2	Hawaii 1993 Monthly Landings of Tunas, PMUS, and BMUS	V.34
V.1.3	Hawaii 1993 Monthly Landings of Wahoo, Mahimahi, and Billfish	V.35
V.1.4	Hawaii 1993 Monthly Landings of Skipjack, Yellowfin, and Other Tunas	V.35
V.2.1	Hawaii 1979-1993 Average Monthly Landings of Tunas, PMUS, and BMUS	V.36
V.2.2	Hawaii 1979-1993 Average Monthly Landings of Wahoo and Mahimahi	V.36
V.2.3	Hawaii 1979-1993 Average Monthly Landings of Marlin Species	V.37
V.2.4	Hawaii 1979-1993 Average Monthly Landings of Swordfish, Sailfish, and Spearfish	V.37
V.2.5	Hawaii 1979-1993 Average Monthly Landings of Skipjack, Yellowfin, and Other Tunas	V.38
V.2.6	Hawaii 1979-1993 Average Monthly Landings of BMUS, Onaga, and Opakapaka	V.38
V.2.7	Hawaii 1979-1993 Average Monthly Landings of BMUS, Ehu, and Uku	V.39

## LIST OF HAWAII FIGURES (cont.)

Table	Title	Page
V.3.1	Hawaii 1979-1993 Annual Trend of Fisheries Categories Pelagic, Bottom, Reef, and Other	V.39
V.3.2	Hawaii 1979-1993 Annual Trends of Total Commercial Landings	V.40
V.3.3	Hawaii 1979-1993 Annual Trends of Tunas, PMUS, and BMUS Landings	V.40
V.3.4	Hawaii 1979-1993 Annual Trends of Wahoo, Mahimahi, and Billfish	V.41
V.3.5	Hawaii 1979-1993 Annual Trends of Skipjack, Yellowfin, and Other Tunas	V.41
V.4.1	Hawaii 1979-1993 Landings of Wahoo	V.42
V.4.2	Hawaii 1979-1993 Landings of Mahimahi	V.42
V.4.3	Hawaii 1979-1993 Landings of Blue Marlin	V.43
V.4.4	Hawaii 1979-1993 Landings of Black Marlin	V.43
V.4.5	Hawaii 1979-1993 Landings of Striped Marlin	V.44
V.4.6	Hawaii 1979-1993 Landings of Sailfish	V.44
V.4.7	Hawaii 1979-1993 Landings of Shortnose Spearfish	V.45
V.4.8	Hawaii 1979-1993 Landings of Broadbill Swordfish	V.45
V.4.9	Hawaii 1979-1993 Landings of Skipjack Tuna	V.46
V.4.10	Hawaii 1979-1993 Landings of Yellowfin Tuna	V.46
V.4.11	Hawaii 1979-1993 Landings of Onaga	V.47
V.4.12	Hawaii 1979-1993 Landings of Opakapaka	V.47
V.4.13	Hawaii 1979-1993 Landings of Ehu	V.48
V.4.14	Hawaii 1979-1993 Landings of Uku	V.48

## BACKGROUND

This report has been compiled by governmental fisheries agencies of several islands in the central and western Pacific area in a cooperative and continuing effort to improve the availability and dissemination of fisheries information. The data contained herein have been collected, computerized, edited, and processed by agencies participating in the Western Pacific Fishery Information Network (WPACFIN), including American Samoa's Department of Marine and Wildlife Resources (DMWR), the Commonwealth of the Northern Mariana Islands' (CNMI) Division of Fish and Wildlife (DFW), Guam's Division of Aquatic and Wildlife Resources (DAWR), Hawaii's Division of Aquatic Resources (HDAR) and the Southwest Fisheries Science Center's (SWFSC) Honolulu Laboratory, National Marine Fisheries Service (NMFS). The data summaries and graphs contained in this document were prepared by WPACFIN staff at the Honolulu Laboratory from data collected by WPACFIN or provided by these agencies. Data from DMWR and DFW were supplied on floppy diskettes in established WPACFIN data base formats, whereas data on the Guam commercial fisheries were collected on forms provided to fish wholesalers by WPACFIN through DAWR. Data for Hawaii were provided by HDAR on floppy diskettes or via a dial-in telecommunications link. Once data from all agencies were put into the proper format on the central WPACFIN computer and appropriate edit and verification procedures completed, summary reports and files were produced using software developed specifically for this purpose. Graphs were produced using commercially available software.

## PROGRESS

In 1981, when WPACFIN began assisting agencies in improving their data collecting and processing systems, only the State of Hawaii had computerized processing. By mid-1982, fisheries offices in American Samoa, Guam, and the CNMI had implemented computerized processing on microcomputers supplied by WPACFIN. Since that time, these agencies have made many significant improvements to their data collecting systems and have established sound automated data processing systems. Most agencies can now provide fishery statistics to WPACFIN within 45 days of the date of collection. However, the Guam DAWR office experienced serious staff shortages in 1992 and 1993 that prevented them from processing their creel survey data into standardized formats, therefore only commercial landings data are presented in this volume. The HDAR has also improved its systems in recent years and has significantly reduced the lag time in data processing from about 2.5 years to less than 3 months for most data. The HDAR has also improved its procedures for editing, updating, and processing Hawaii's data. The biggest problems still facing HDAR in improving their data systems are reducing delinquency of fishermen reporting and implementing a validation system to ensure that what gets reported by fishermen is accurate.

## PRECAUTIONS

Data collecting and processing systems vary greatly among Pacific island fisheries agencies. Although much standardization has taken place and is continuing, there remain many unique aspects of each island's systems based on local needs and capabilities. When using summaries contained in this report, especially if making comparisons, one should keep in mind the nature of the systems used to produce the data. For instance, Hawaii's commercial landings data are based on mandatory monthly reporting by licensed commercial fishermen, CNMI's data are based on voluntary monthly reporting of fish buyers using government-provided invoices, Guam's data are from WPACFIN-sponsored voluntary reporting by major commercial dealers, and American Samoa's data are based on creel survey sampling of participation and interviews of fishermen and a data expansion program. Each system has advantages and disadvantages, and the user should be aware of them when comparing or interpreting data.

The user should also be aware that species assemblages vary among island groups, as do cultural preferences and principal fishing techniques. Population size is of particular importance when making interpretations of the relative value and importance of the fisheries. To help the user make these value judgments, more detailed explanations of the data collecting and processing systems are provided in each island's section of this report.

## CONTENTS

This document is divided into sections by island group. Each section contains reports on the monthly and annual landings by species or species groups for the commercial fleet. The section for American Samoa also contains estimates of total catch and effort of all boat-based fisheries including recreational and subsistence fishing activities. These estimates and their associated confidence limits were generated by computer-based data expansion systems using sample fishery data collected by creel survey programs. Commercial landings for American Samoa were calculated based on information gathered during the creel survey sampling program. Two sets of annual summaries are included for Hawaii, one each for commercial landings that were sold and not sold.

## Definitions

In addition to the description of the systems and the monthly and annual reports, each section contains graphs of some of the summary fishery statistics of particular interest or

### I.3

importance to participating WPACFIN agencies. For purposes of graphical presentation of the data, several categories have been defined for each island's fisheries. Because of differences in reporting systems and capabilities among the islands, species contained within each category may vary, but all categories are documented in each island's section. Overlap exists among some of the categories used for different graphs. Categories used in the graphs include the following:

1. Fisheries Categories - These are combinations of species of similar ecological types, specifically, pelagic, bottom fish, reef fish, and "other." "Other" includes groups that generally traverse these categories, such as certain sharks and jacks, or are not typically included in these groups, such as mullet and milkfish.
2. Pelagic Management Unit Species (PMUS) - The Magnuson Fishery Conservation and Management Act of 1976 was amended in 1992 to place tunas under U.S. jurisdiction for management. The Fishery Management Plan for Pacific pelagic species was amended to reflect this change. However, this report series will continue to treat the tunas as a separate category for graphical purposed. Therefore, the PMUS category in this document includes only the billfishes, wahoo, mahimahi, and oceanic sharks.
3. Bottom Fish Management Unit Species (BMUS) - Defined as the species of initial importance in the Fishery Management Plan for bottom fish and seamount fisheries, including the major deepwater snapper, grouper, emperor, and certain jacks.
4. Tunas - Predominantly skipjack and yellowfin tunas in all areas, but also including most other tuna species and excluding wahoo. In Hawaii bigeye tuna are also of major importance in recent years.
5. Other Tunas - All tunas as defined above, but excluding skipjack and yellowfin tunas.
6. Billfish - Combination of all marlin, sailfish, spearfish, and swordfish species.

### Graphics

A minimum of four types of graphs are provided with each island's data. The chapter for American Samoa has an additional type of graph on catch and effort from creel survey data. Type I graphs present summary charts of the major species and species groups for 1993. Type II graphs are seasonality plots for the major species or species groups, showing the average weight

landed during each month for all years combined. Type III graphs are based on annual summary statistics and help visualize the variability among years. Type IV graphs are plots of monthly landings of some of the major commercially important species and document fluctuations in landings of these species over the entire time series. Type V graphs are based on creel survey data and include plots of catch and effort by fishing method plus a combination of several of the types I-IV graphs.

I. Monthly graphs for each year's data including:

- A. Major fisheries categories
- B. Tunas, PMUS, and BMUS
- C. Wahoo, mahimahi, and billfish
- D. Skipjack, yellowfin, and other tunas

II. Plots of average monthly landings for:

- A. Tunas, PMUS, and BMUS
- B. Wahoo and mahimahi
- C. Billfish species:
  - 1. Marlin and sailfish - American Samoa and CNMI
  - 2. Blue marlin, black marlin, and striped marlin - Hawaii
  - 3. Sailfish, shortbill spearfish, and swordfish - Hawaii
- D. Skipjack, yellowfin, and other tunas
- E. BMUS and the most important bottom fish species
  - 1. BMUS, ehu, and onaga - American Samoa
  - 2. BMUS, emperor, and grouper - CNMI and Guam
  - 3. BMUS, onaga, and opakapaka - Hawaii
  - 4. BMUS, ehu, and uku - Hawaii

III. Graphs of annual summary statistics for:

- A. Major fisheries categories
- B. Total commercial landings - pounds and dollars
- C. Tunas, PMUS, and BMUS
- D. Wahoo, mahimahi, and billfish
- E. Skipjack, yellowfin, and other tunas

IV. Graphs of monthly landings over the entire time series for the following major species:

- A. Wahoo - All four areas
- B. Mahimahi - All four areas
- C. Blue marlin - All four areas
- D. Black marlin - Hawaii
- E. Striped marlin - Hawaii
- F. Sailfish - American Samoa, Guam, and Hawaii
- G. Shortbill spearfish - Guam and Hawaii
- H. Swordfish - Hawaii
- I. Skipjack tuna - All four areas
- J. Yellowfin tuna - All four areas



I.5

- K. Opakapaka - Hawaii
  - L. Onaga - American Samoa and Hawaii
  - M. Uku - Hawaii
  - N. Ehu - American Samoa and Hawaii
  - O. Emperors - CNMI and Guam
  - P. Grouper - CNMI and Guam
- V. Graphs of certain statistics generated by creel surveys for American Samoa
- A. Offshore monthly catch by method
  - B. Offshore monthly effort by method
  - C. Offshore annual catch and effort for the time series